

PATENT ABSTRACTS OF JAPAN

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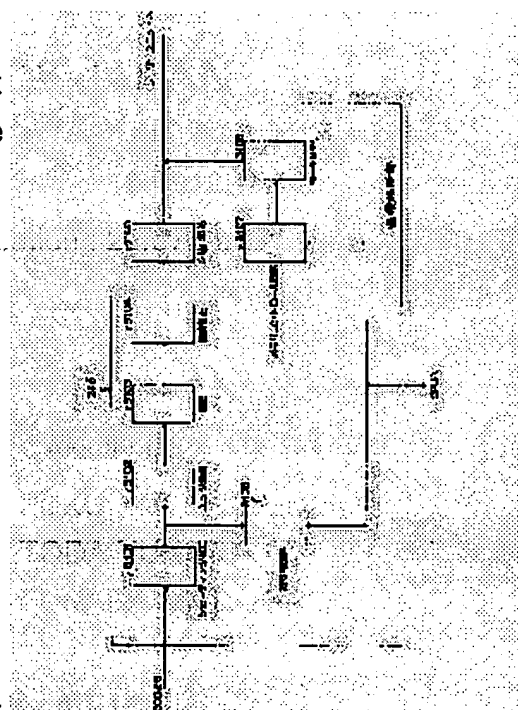
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(54) IMAGE PROCESSOR AND ITS IMAGE PROCESSING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To output images in correct directions at the time of both-face printing and at the time of reduced layout output by optically scanning an original, judging the character area of input images based on obtained image signals and detecting the direction of the original.

SOLUTION: For the image signals from a CCD, after dispersion among picture elements is corrected by a shading correction circuit 3101, secondary differentiation is performed and an image edge is emphasized in an edge emphasis circuit 3102. Then, in a variable power circuit 3103, a data thinning processing at the time of reduced copying is performed and data interpolation at the time of magnified copying is performed. Further, after desired density conversion is performed by a density correction circuit 3104, binarization is performed in a binarization circuit 3105. The binarized image signals are transmitted to a laser unit or kept in a page memory 3108. In a reduced layout, the image signals are edited on the page memory 3108 by the control of a memory control circuit 3107. Also, a direction discrimination part 3106 judges the direction of the original and the writing direction of a document and transmits judgement information to a CPU.



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CLAIMS

[Claim(s)]

[Claim 1] It is the image processing system characterized by to have a means direct said predetermined image output, a means judge the alphabetic character field of an input image based on said picture signal, and a means detect the sense of said manuscript from said judgment result, in the image processing system which scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, and to be performed said predetermined image output based on said detection result.

[Claim 2] It is the image processing system which is equipped with a means specify the list and the binding location of a document on said manuscript as a means direct said predetermined image output in the image processing system which scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, at least, and is characterized by to be performed said predetermined image output in the sense and the document list according to said assignment.

[Claim 3] Furthermore, it is the image processing system according to claim 1 which is equipped with a means to specify the class of said manuscript beforehand, and is characterized by restricting detection of the sense of said manuscript to this assignment.

[Claim 4] The image processing system according to claim 3 characterized by including the class of language which constitutes the document of this manuscript in the class of said manuscript.

[Claim 5] The sense of said manuscript is an image processing system according to claim 4 characterized by being detected by matching of the direction according to the class of said language.

[Claim 6] It is the image processing system according to claim 1 characterized by performing the judgment of said alphabetic character field based on the histogram analysis to said picture signal.

[Claim 7] Claim 1 characterized by including a double-sided printout and a cutback layout output in said predetermined image output at least, or an image processing system according to claim 2.

[Claim 8] The process which is the image-processing approach in the image processing system which scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, and directs said predetermined image output, It is the image-processing approach characterized by having the process which judges the alphabetic character field of an input image based on said picture signal, and the process which detects the sense of said manuscript from said judgment result, and performing said predetermined image output based on said detection result.

[Claim 9] It is the image-processing approach which is equipped with the process which specifies the list and the binding location of a document on said manuscript as the process which is the image-processing approach in the image processing system which scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, and directs said predetermined image output at least, and is characterized by to be performed said predetermined image output in the sense and the document list according to said assignment.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image processing system and the image-processing approach which can do for example, a double-sided printout, a cutback layout output, binding margin positioning, a staple, etc.

[0002]

[Description of the Prior Art] Although it has a double-sided printout, a cutback layout output, a staple function, etc. and the function is conventionally used by user actuation with image formation equipments, such as a copying machine and a printer, they are possible only in the output paper of the sense decided beforehand.

[0003]

[Problem(s) to be Solved by the Invention] With the above-mentioned conventional equipment, as mentioned above, only in the output paper of the sense decided beforehand, since implementation of the above-mentioned function is possible, nonconformity as shown in drawing 11 occurs.

[0004] Although (a) of drawing 11 and (b) are the examples of a double-sided printout and it is satisfactory at the time of left binding (horizontal binding), when filing a top (vertical binding), the upper and lower sides on the back will become reverse. (c) of drawing 11, (d), (e), and (f) are the examples of an output of the cutback layout called 1 4 inches. Although (c) of this drawing is satisfactory when a manuscript is lateral writing, it will become a list with an unnatural output-statement document like a newspaper at the time of a columnar-writing document, for example. Moreover, in the case of a lateral-writing document, the output-statement document of (d) is unnatural [it may be clearly unnatural and, in the case of a columnar-writing document, the list of a graphic display is sufficient as (e) at the case where a manuscript is inputted into a vertical upside-down, but]. Furthermore, it is clearly unnatural from the situation of a graphic display also about (f).

[0005] (g) of drawing 11 and 4 inches (h) are the examples of an output at the time of carrying out the double-sided printout of the cutback layout output of 1 further. In the case of horizontal binding, (g) of this drawing is good, but in the case of top binding, a rear face becomes vertical reverse. Also about the case of binding when shown in (h), it is clearly unnatural. In this way, when aimed at the document of lateral-writing language, such as English, a response of the columnar-writing document which was required of Japanese may cause an incorrect judging, if it is processed similarly, although it is unnecessary. Then, as shown in drawing 12, it is necessary to correct the sense of the image outputted at the time of a double-sided printout and a cutback layout output.

[0006] In addition, (a) - (h) of drawing 12 corresponds to (a) - (h) of drawing 11. Moreover, when shown in drawing 13 R> 3, it files in vertical binding, there is bottom binding among it, and as shown in drawing 14, there are left binding and right binding as horizontal binding.

[0007] The place which this invention was made in view of the above-mentioned technical problem, and, is made into the object is offering the image processing system and the image-processing approach of outputting the image of the right sense at the time of a double-sided printout and a cutback layout

output.

[0008]

[Means for Solving the Problem] In the image processing system which this invention scans a manuscript optically, and processes the acquired picture signal electrically and performs a predetermined image output in order to attain the above-mentioned object It has a means to direct said predetermined image output, a means to judge the alphabetic character field of an input image based on said picture signal, and a means to detect the sense of said manuscript from said judgment result, and said predetermined image output is performed based on said detection result.

[0009] Moreover, in the image processing system which other invention scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, at least, it has a means to direct said predetermined image output, and a means specify the list and binding location of a document on said manuscript, and said predetermined image output is performed in the sense and document list according to said assignment.

[0010] In the image-processing approach in the image processing system which invention of further others scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output It has the process which directs said predetermined image output, the process which judges the alphabetic character field of an input image based on said picture signal, and the process which detects the sense of said manuscript from said judgment result, and said predetermined image output is performed based on said detection result.

[0011] Moreover, it is the image-processing approach in the image processing system which other invention scans a manuscript optically, processes the acquired picture signal electrically, and performs a predetermined image output, and it has the process which directs said predetermined image output, and the process which specifies the list and the binding location of a document on said manuscript, and said predetermined image output is performed in the sense and the document list according to said assignment at least.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of operation concerning this invention is explained to a detail with reference to an accompanying drawing.

[General view of equipment] drawing 1 is the cross-sectional view showing the structure of the image formation equipment concerning the gestalt of operation of this invention. In this drawing, 101 is manuscript base glass and a manuscript is laid in the predetermined location on it. 102 is the manuscript lighting lamp which consists of halogen lamps, and exposes the manuscript laid in manuscript base glass 101. 103,104,105 is a scan mirror, and it leads the reflected light from a manuscript to the CCD unit 106, holding in the optical scan unit which is not illustrated and reciprocating. This CCD unit 106 consists of CCD driver 109 grades which drive the image formation lens 107 which carries out image formation of the reflected light from a manuscript to CCD (charge-coupled device), the image sensor 108 which consists of CCD, and an image sensor 108. The picture signal output from an image sensor 108 is inputted into the controller section 139 after being changed into 8-bit digital data.

[0013] 110 is a photoconductor drum and is discharged in preparation for subsequent image formation with the pre-exposure lamp of 112. 113 is an electrification machine and electrifies a photoconductor drum 110 uniformly. Moreover, 114 is an exposure means, for example, consists of semiconductor laser etc., exposes a photoconductor drum 110 based on the image data processed in the controller section 139 which performs control of an image processing and the whole equipment, and forms an electrostatic latent image.

[0014] 115 is the 1st development counter, it is an exchangeable configuration and the user of equipment can set it to the position in equipment easily. The black developer (toner) is held in it. In addition, the waste toner detection sensor 211 which detects the amount of toners in a development counter is arranged, and the output signal is inputted into a development counter 115 at I/O interface 205 mentioned later. 119 is a front [imprint] electrification machine, and before it imprints the toner image developed on the photoconductor drum 110 in the record paper, it applies high tension. It is fed with an imprint form by actuation of each feed roller 121,123,125 into equipment, 120,122,124 is a feed unit, it

lighting lamp which consists of halogen lamps, and exposes the manuscript laid in manuscript base glass

stops in the arrangement location of the resist roller 126, and it is re-fed with it after beginning timing with the latent image formed in the photoconductor drum 110 is taken.

[0015] 127 is an imprint electrification machine and imprints the toner image developed by the photoconductor drum 110 in the imprint form fed. 128 is a separation electrification machine and separates the imprint form which the above-mentioned imprint actuation ended from a photoconductor drum 110. In addition, the toner which remained on the photoconductor drum 110, without imprinting is recovered by the cleaner 111. 129 conveys the imprint form which is a conveyance belt and carried out imprint process killing to a fixing assembly 130, for example, is fixed with heat. Moreover, 131 is a flapper and controls the conveyance pass of an imprint form which carried out fixation process killing to either of the orientation of a paper output tray 132 or Trey Nakama 137.

[0016] 133-136 are feed rollers, and it is reversed (multiplex), or noninverting (both sides) is carried out, and they feed Trey Nakama 137 with the imprint form which carried out fixation process killing once. 138 is a re-feed roller and conveys again the imprint form laid by Trey Nakama 137 to the arrangement location of the resist roller 126. In addition, the controller section 139 is equipped with a microcomputer, the image-processing section, etc. which are mentioned later, and performs above-mentioned image formation actuation according to the directions from a control panel.

[Controller section] drawing 2 is the block diagram showing the configuration of the controller section 139 of the image formation equipment concerning the gestalt of this operation. In this drawing, 201 is CPU (central data-processing section) which controls this whole image processing system, reads a program in the read-only memory (ROM) 203 which memorized the control procedure (control program) of the body of equipment one by one, and performs it. Moreover, the address bus AB and data bus DB of CPU201 are connected to each load through the bus driver circuit 202 and the address recorder circuit 207. And 204 is random access memory (RAM) which is the main storage used as storage, working storage, etc. of input data.

[0017] 205 is an I/O interface, an operator keys it and the condition of this equipment etc. is connected to each load of the equipment of the paper detection sensors 210 grade for detecting the control panel 140 displayed using liquid crystal, LED, etc., and the motors 297 which perform actuation of a feed system, a conveyance system, and optical system, clutches 208, solenoids 209 and the form conveyed. 215 is a high-voltage unit and outputs high voltage to the above-mentioned electrification machine, a development counter, a front [imprint] electrification machine, an imprint electrification machine, and a separation electrification machine according to directions of CPU. It is the image-processing section, the picture signal outputted from the CCD unit 106 is inputted, and 206 outputs the control signal of the laser unit 114 according to the obtained image data, after performing the image processing mentioned later. Consequently, the laser beam outputted from the laser unit 114 irradiates the photoconductor drum 110 of drawing 1.

[Image-processing section] drawing 3 is the block diagram showing the configuration of the image-processing section 206 in the controller section 139 of the image formation equipment concerning the gestalt of this operation. In the image-processing section shown in this drawing, first, by the shading compensation circuit 3101, after the picture signal changed into the electrical signal from CCD108 performs dispersion amendment between pixels, in the edge intensifier 3102, it performs secondary differential in the window of 5x5, and emphasizes the edge of an image.

[0018] Furthermore, in the variable power circuit of 3103, infanticide processing of data is performed at the time of a cutback copy, and it interpolates data at the time of an amplification copy. And after desired concentration conversion is made by the concentration amendment circuit of 3104, in the binary-ized circuit 3105, it is made binary by it. In addition, a simple binary method, a screen method, an error diffusion method, or the other approaches are sufficient as the method of binary-izing here.

[0019] The picture signal made binary as mentioned above is sent to the laser unit 114, or is held at the page memory 3108. Control of an above-mentioned cutback layout etc. is outputted to the laser unit 114, once edit is performed on memory, after the picture signal was stored in the page memory 3108. The editing task on this memory is performed by the memory control circuit 3107.

[0020] 3106 is the direction distinction section which is a means to detect the sense of a manuscript, and

performs the sense (four directions) on which the manuscript was put and columnar writing of a document, and the judgment of lateral writing. CPU201 receives delivery and the processing result of a there for the information inputted from the control unit, for example, Japanese, and English in the direction distinction section 3106. And CPU201 gives directions to the memory control circuit 3107 based on the information inputted from the information received from the direction distinction section 3106, a control unit, etc. This memory control circuit 3107 performs the editing task of the image on the page memory 3108 based on directions of CPU201.

[Control-panel section] drawing 4 is drawing showing one example of the face-of-a-board configuration of the control unit of the image formation equipment concerning the gestalt of this operation. In this drawing, 401 is a ten key for performing copy number of sheets and other required numerical setting out, and 402 is a copy start key which directs initiation of a copy. Moreover, 403 is a large-sized liquid crystal touch panel, a key can be displayed on liquid crystal and an operator can perform desired operator guidance by carrying out the depression of the displayed key with a finger.

[0021] 404, 405 is a key for performing language assignment of an input manuscript. Among these, 404 is a key which specifies the language in which both columnar writing / lateral writing like Japanese are possible, and 405 is a key which specifies lateral-writing language like English. In addition, although the key other than the above exists on the liquid crystal touch panel 403, since they are not directly related to this invention, they omit those explanation here.

The direction distinction section 3106 concerning the gestalt of [actuation of the direction distinction section] book operation takes out reception and its alphabetic character field for the image data from above-mentioned CCD. Drawing 5 - drawing 8 are drawings on which the alphabetic character field in an input image was judged, and the rectangle field was drawn, and are drawing for the alphabetic character field taking out and explaining one example of the direction. Here, as shown by (a) of drawing 6, an alphabetic character field takes out and the approach in histogram analysis is used as a direction.

[0022] First, from the input image shown in drawing 5, as shown in drawing 6, a line is started from the field judged to be an alphabetic character field. And to the alphabetic character which started the alphabetic character to the started line (drawing 7), next was started, as shown in drawing 8, 0 times, 90 degrees, 180 degrees, and 270 matching are performed. Consequently, let the high direction of whenever [match] be the sense of a manuscript most. Moreover, from the direction of a line, and the direction of an alphabetic character, the information on columnar writing/lateral writing is acquired, and the sense of them and a manuscript is returned to CPU201 of the body of equipment.

[0023] Moreover, what is necessary is to perform 0 times and 180 matching or just to perform 90 degrees and 270 matching according to the direction of a line, in lateral-writing language like English shown in drawing 10, since it will be limited to a 2-way (the inside of drawing, 802), if a line can be started although the 4 direction matching (702 show among drawing) must be performed in columnar writing like Japanese, and the language which may have both lateral writing as shown in drawing 9.

[0024] Thus, the direction distinction section 3106 carves above-mentioned 4 directions / 2-way matching processing by receiving the language assignment parameter inputted from the control unit of the body of equipment.

[0025] According to the gestalt of this operation, as explain above, possibility that the nonconformity by direction detection mistake will happen in the case of lateral writing language like English can be make small, and the sense can obtain a right image at the time of a double-sided printout and a cutback layout output because it can be made to perform assignment of whether a user be the language of only lateral writing of an input manuscript through a control unit, or the case of columnar writing be also a certain language.

[0026] In addition, when shipping this equipment to the area which uses the language of lateral writing like English or French regularly, since it is unnecessary in processing which receives Japanese, as for a user, CPU201 always directs the document of an installation manuscript in the purport and the direction judging section 106 which are lateral-writing language. Or when shipping to such an area, a manuscript may be made to process without the directions from other control sections in the direction judging section 106 as what is always lateral-writing language. In such a case, for example, a DIP switch, it sets

up at the time of shipment.

[0027] In addition, even if it applies this invention to the system which consists of two or more devices (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the equipments (for example, a copying machine, facsimile apparatus, etc.) which consist of one device.

[0028]

[Effect of the Invention] As explained above, according to this invention, the alphabetic character field of an input image is judged based on the picture signal acquired from the manuscript, the sense of a manuscript is detected, and the image of the right sense can be outputted at the time of a double-sided printout and a cutback layout output by performing the double-sided printout directed based on the result, and a cutback layout output.

[0029]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross-sectional view showing the structure of the image formation equipment concerning the gestalt of operation of this invention.

[Drawing 2] It is the block diagram showing the configuration of the controller section of the image formation equipment concerning the gestalt of this operation.

[Drawing 3] It is the block diagram showing the configuration of the image-processing section of controller circles of the image formation equipment concerning the gestalt of this operation.

[Drawing 4] It is drawing showing one example of the face-of-a-board configuration of the control unit of the image formation equipment concerning the gestalt of this operation.

[Drawing 5] It is drawing showing an input image.

[Drawing 6] It is drawing showing signs that a line is started from the field judged to be an alphabetic character field.

[Drawing 7] It is drawing showing signs that an alphabetic character is started to the started line.

[Drawing 8] It is drawing showing signs that 0 times, 90 degrees, 180 degrees, and 270 matching are performed to the started alphabetic character.

[Drawing 9] It is drawing showing the 4 direction matching.

[Drawing 10] It is drawing showing 2-way matching.

[Drawing 11] It is drawing showing the example of an output with nonconformity.

[Drawing 12] It is drawing showing the normal example of an output.

[Drawing 13] It is drawing for filing, when it is the example of vertical binding, and explaining bottom binding.

[Drawing 14] It is drawing for explaining left binding and right binding which are the example of horizontal binding.

[Description of Notations]

139 Controller Section

140 Control Panel

201 CPU (Central Data-Processing Section)

202 Bus Driver Circuit

203 Read-only Memory (ROM)

204 Random Access Memory (RAM)

205 I/O Interface

207 Address Recorder Circuit

215 High-voltage Unit

[Translation done.]

[Drawing 7] It is drawing showing signs that an alphabetic character is started to the started line.

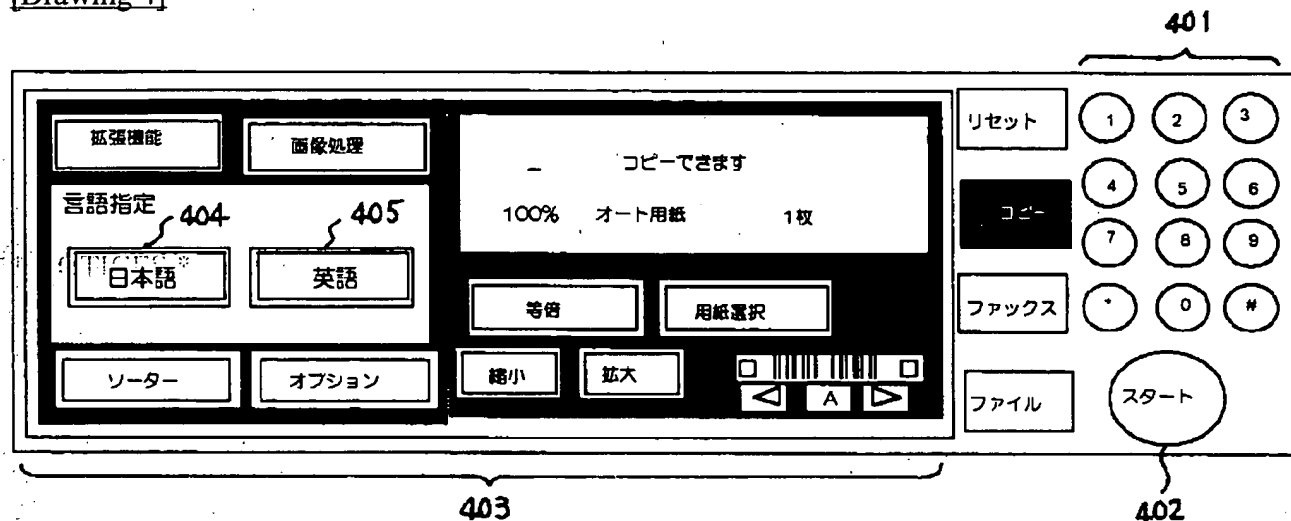
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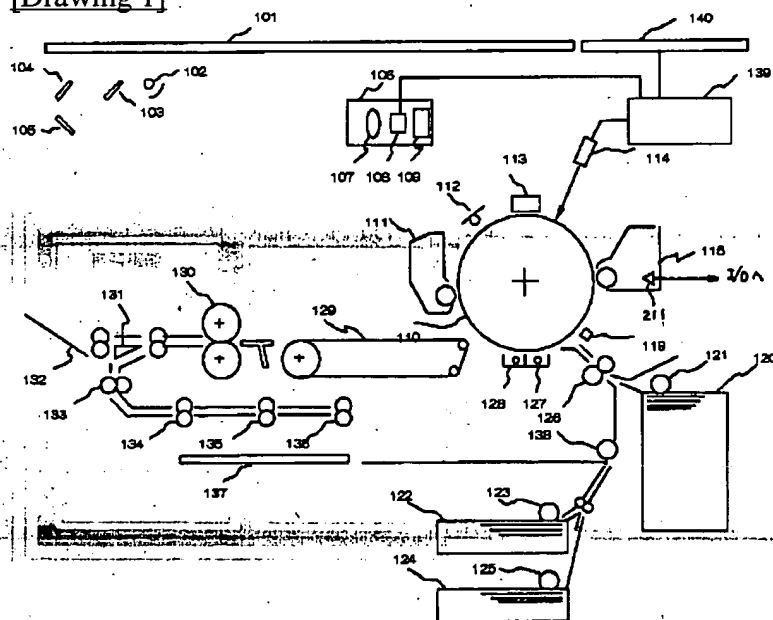
DRAWINGS

[Drawing 4]

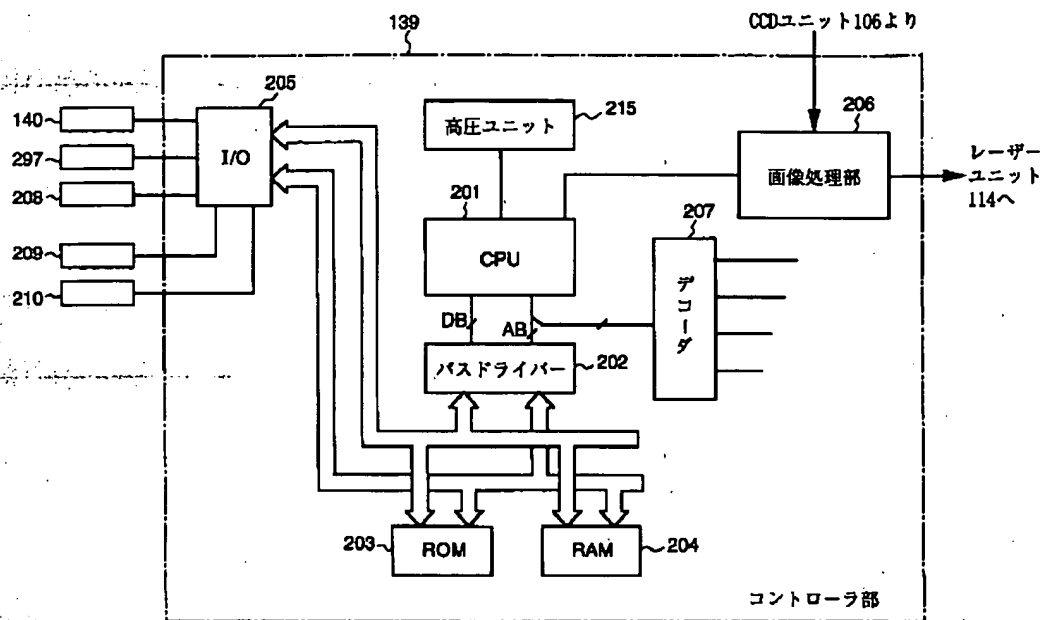


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[Drawing 1]



[Drawing 2]



[Drawing 5]

1. 本発明の名称
2. 特許 文字認識装置
3. 複写機における文字認識装置の使用方法是、...



[Drawing 7]

1. 本発明の名称

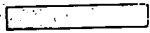
[Drawing 8]

	0°	90°	180°	270°
	本	本	本	本
認識文字	本	町	克	式
マッチ度	0.90	0.40	0.30	0.50

[Drawing 9]

	本発明の実施例
	本発明の実施例
	本発明の実施例
	本発明の実施例
701 行矩形	702 日本語の場合

[Drawing 10]



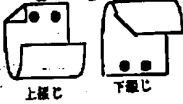
801 行矩形

I have a pen.
I used a pen.

802 英語の場合

[Drawing 13]

縦綴じ



[Drawing 14]

横綴じ

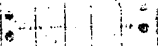


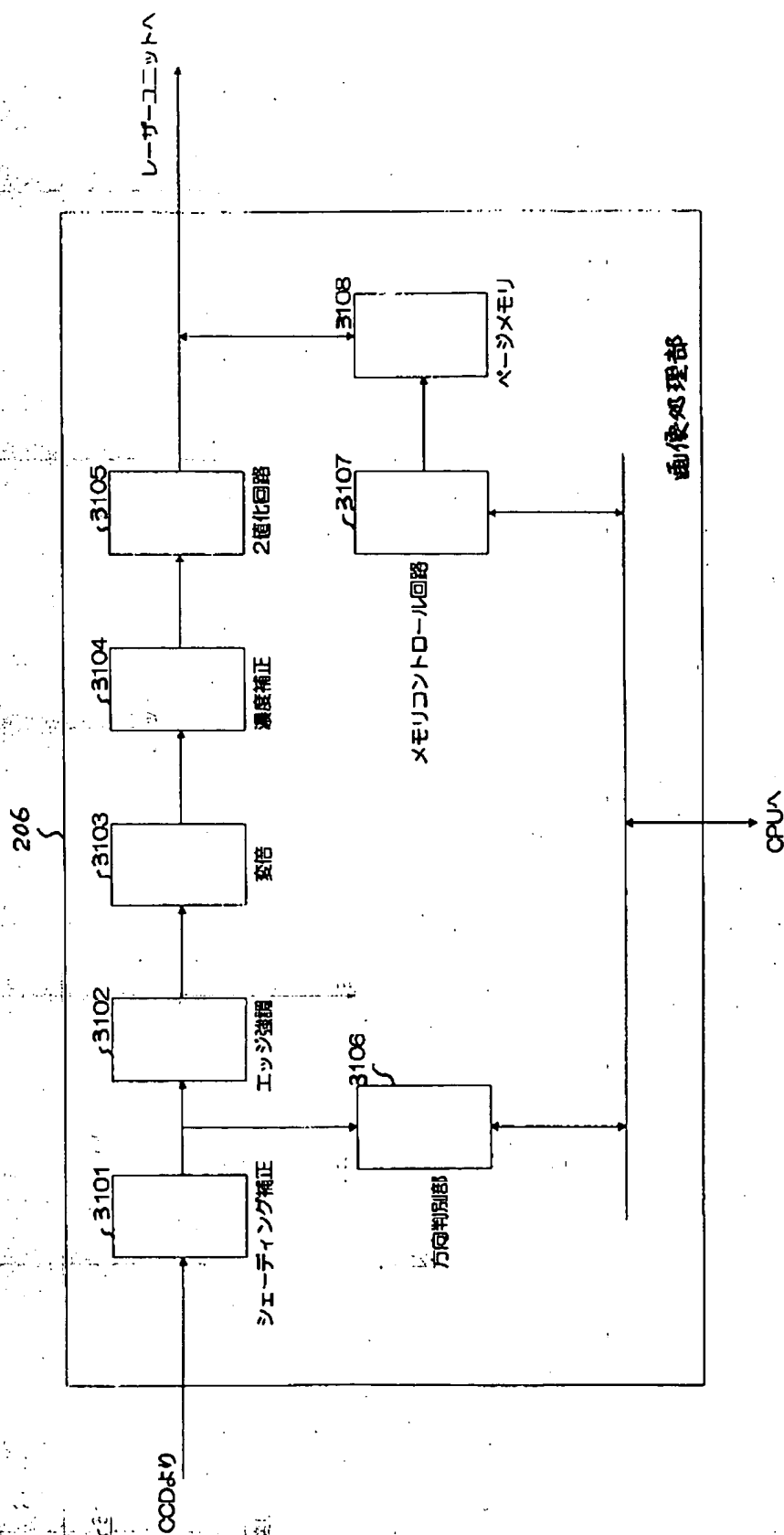
[Drawing 3]

801 行矩形

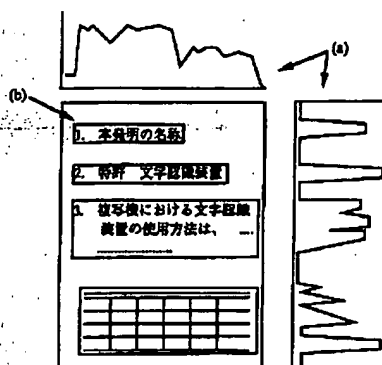
802 英語の場合

横綴じ

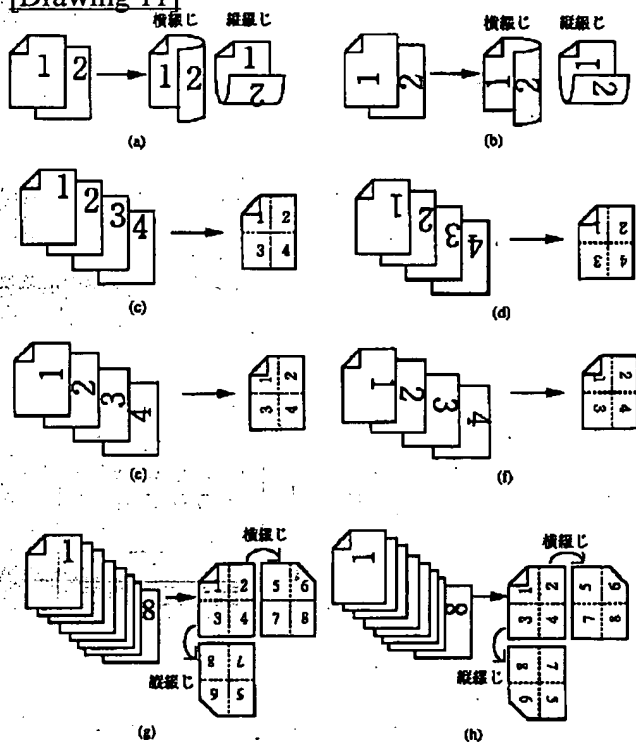




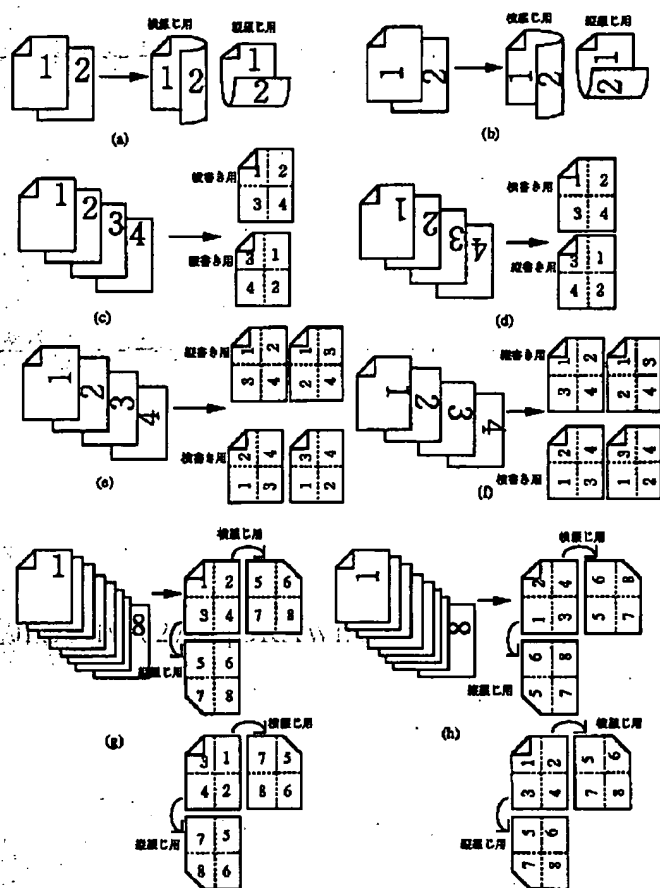
[Drawing 6]



[Drawing 11]



[Drawing 12]



[Translation done.]